

To: Harris County Precinct Two Commissioner Adrian Garcia
From: Katie Short, Director; Amber Weed, Chief of Staff and Director of Policy; Ramin Naderi, Analyst; Aresha Davwa, Analyst
CC: Mike Lykes, Mercedes Sánchez, Kris Banks, and Matt Garry with Precinct Two; Barbie Robinson, Dr. Ericka Brown, Jennifer Kiger, Allison Reese, Beth Carpenter, Jo Ann Monroy, Rachel White, and Emma Klein with Harris County Public Health
Date: October 25, 2022
Re: **Monthly Memo on Monkeypox Vaccine Distribution and Cases, October 2022**

EXECUTIVE SUMMARY

In August 2022, Precinct Two requested the Analyst's Office produce a monthly memo regarding the monkeypox virus outbreak in Harris County in collaboration with Harris County Public Health. This is the second memo of a standing memo the Analyst's Office produces as the response to the monkeypox virus continues to evolve at the federal, state, and local levels.

This memo reports on both monkeypox virus cases and monkeypox vaccine distribution in Harris County as of October 9, 2022.

Key data points include:

- As of October 9, 2022, **9,285 individuals (63.3%) received their first dose, and 5,370 (36.6%) individuals received their second dose** of the Monkeypox vaccine.ⁱ
ii
- The number of individuals fully vaccinated in Harris County increased 101% from September to October, from 2,675 fully vaccinated individuals in September to 5,370 fully vaccinated individuals in October.
- The number of individuals in Harris County who have received at least one dose of the JYNNEOS monkeypox vaccine varies by race and ethnicity:
 - **0.3% (31) identify as American Indian/Alaskan Native;**
 - **4.6% (430) identify as Asian American/Pacific Islander;**
 - **21.6% (2,010) identify as Black;**
 - **31.4% (2,924) identify as Hispanic/Latino;**
 - **36.2% (3,365) identify as White;**
 - **1.5% (139) identify as Multi-Racial; and**
 - **4.4% (408) identify as Other.**

ⁱ According to the CDC, an individual being considered fully vaccinated 14 days after receiving the second dose of the monkeypox vaccine.

ⁱⁱ In addition to the 9,285 individuals who received their first dose and 5,370 who received their second dose vaccines, 15 additional individuals received their monkeypox vaccine (for a total of 14,670), but whether they received their first or second dose is not specified in the data.

- As of October 9, 2022, **there were 874 confirmed cases of monkeypox in Harris County.**
- The number of individuals with confirmed cases of monkeypox in Harris County varies by race and ethnicity:
 - **1.3% (11) identify as Asian American/Pacific Islander;**
 - **40.0%. (350) identify as Black;**
 - **29.4% (257) identify as Hispanic/Latino;**
 - **17.2% (150) identify as White;**
 - **12.1% (106) identify as Other/Unknown.**

The Analyst's Office acknowledges Harris County Public Health for their significant contributions to this memo.

INTRODUCTION

In August 2022, Precinct Two requested the Analyst's Office produce a monthly memo regarding the monkeypox virus outbreak in Harris County in collaboration with Harris County Public Health. This memo includes data and analysis regarding monkeypox cases and vaccine administration in Harris County. This is the second memo of a standing memo the Analyst's Office produces as the response to the monkeypox virus continues to evolve at the federal, state, and local levels.

METHODOLOGY

Data utilized in this memo are provided by Harris County Public Health (HCPH). Data reflect monkeypox vaccine doses administered in Harris County by all providers from the first vaccine administered date, June 27, 2022, through October 9.ⁱⁱⁱ Data regarding confirmed cases are from June 18, 2022, through October 9, 2022.^{iv} ¹

Data Collected from Harris County Public Health (HCPH)

Harris County Public Health (HCPH) is the primary data source for this memo. HCPH staff analyze vaccine data received by the Texas Department of State Health Services' (DSHS) ImmTrac2 system. Currently, it is required that providers report monkeypox vaccinations to DSHS's ImmTrac2 system for clients that consent to being a part of the ImmTrac2 system. In addition, HCPH records vaccination data in Harris County's Epic electronic health monitoring record (EMR) software.

As the Local Health Authority for the County, HCPH also receives data on confirmed cases from local health providers (including the City of Houston) and other sources.

BACKGROUND

The spread of the monkeypox virus began in the United States in May 2022.² On August 4, 2022, the US Department of Health and Human Services declared a public health emergency in response to the current monkeypox outbreak.³

Monkeypox is a disease caused by infection with the monkeypox virus.⁴ The monkeypox virus is an "enveloped double-stranded DNA virus that belongs to the *Orthopoxvirus* genus of the *Poxviridae* family."⁵ The first case of monkeypox identified in humans occurred in 1970 in the Democratic Republic of the Congo.⁶ Human-to-human transmission of monkeypox is often the result of close contact with respiratory secretions and skin lesions of an infected individual.⁷ Transmission from respiratory droplet particles usually requires prolonged face-to-face contact.⁸ Transmission can also occur via the placenta from a mother to a fetus.⁹

Anyone can contract the monkeypox virus regardless of their sexual orientation or sex/gender. However, most monkeypox cases reported in the current outbreak have occurred among men who have sex with men. Gay or bisexual men who have recently

ⁱⁱⁱ The Houston Health Department administered the first JYNNEOS vaccine in Harris County on June 27, 2022.

^{iv} The Houston Health Department announced the first case of monkeypox in Harris County on June 18, 2022.

had multiple or anonymous sexual partners are at the highest risk of contracting monkeypox.¹⁰

Symptoms of monkeypox can include fever, headache, muscle aches, swollen lymph nodes, chills, exhaustion, sore throat, and a painful rash that may look like pimples or blisters.¹¹ The incubation period for monkeypox is typically six to 13 days but can range anywhere from five to 21 days.^{v 12} In most cases, monkeypox is a self-limited disease with symptoms lasting anywhere from two to four weeks.^{vi 13} Individuals with underlying immune deficiencies are at a higher risk of worse outcomes.¹⁴

The Monkeypox Vaccine. Currently, the JYNNEOS vaccine, produced by Bavarian Nordic, is the only vaccine approved by the US Food and Drug Administration (FDA) for the prevention of monkeypox. Under the Centers for Disease Control and Prevention's (CDC) Expanded Access Investigational New Drug (EA-IND) protocol, a second vaccine, the ACAM2000 vaccine, may be offered as an alternative to the JYNNEOS vaccine (ACAM2000 is only approved by the FDA for immunization against the smallpox disease).

For the purpose of this memo, the term “monkeypox vaccine” will be used in reference to the distribution and administration of the JYNNEOS vaccine—this is the only vaccine currently administered by Harris County Public Health and the City of Houston Health Department.

On August 9, 2022, the FDA issued an emergency use authorization (EUA) for use of the JYNNEOS vaccine to help prevent the monkeypox disease. The EUA for the JYNNEOS vaccine includes individuals 18 years and older, as well as individuals under 18 years determined to be at high risk for monkeypox infection.¹⁵ JYNNEOS is administered in two doses; the second dose is administered four weeks after the first dose.¹⁶ According to the CDC, an individual is considered vaccinated against monkeypox 14 days after receiving the second dose of the JYNNEOS vaccine.¹⁷ Originally approved by the FDA in 2019, the EUA issued for the JYNNEOS vaccine allows for a fraction of the original amount of the vaccine to be administered for each dose, increasing the number of doses per vial up to 5-fold.¹⁸

While ACAM2000 is not currently in use by Harris County Public Health and the Houston Health Department for vaccination against monkeypox, it is a vaccine that may be used. In September 2007, the FDA approved the ACAM2000 vaccine for immunization against smallpox disease.¹⁹ Produced by Emergent Product Development Gaithersburg, Inc., the one-dose ACAM2000 vaccine is currently available under the CDC's Expanded Access Investigational New Drug (EA-IND) protocol as an alternative to the JYNNEOS vaccine for monkeypox.²⁰ Unlike typical vaccines, ACAM2000 is administered by pricking the skin several times in the upper arm with a two-pronged needle, which is dipped in the vaccine solution. The vaccine solution contains live vaccinia virus, which is a “pox”-type virus related to smallpox but causes milder disease.²¹ A blister develops at the vaccination site on the skin due to the introduction of the vaccinia virus, and the vaccine stimulates the immune system to develop antibodies to fight against a real monkeypox/smallpox infection.²² An individual is

^v Incubation period refers to the time period between infection and onset of symptoms.

^{vi} Self-limited disease refers to a disease process that resolves spontaneously with or without specific treatment.

considered vaccinated against monkeypox 28 days after receiving a single dose of the ACAM2000 vaccine.²³ The ACAM2000 vaccine has been shown to have more frequent side effects than the JYNNEOS vaccine, with potentially serious complications.^{24 25}

The CDC advises that local jurisdictions administer the JYNNEOS and ACAM2000 vaccines in alignment with the national strategy that focuses on priority populations. The CDC prioritizes individuals to receive a vaccine based on three groups: individuals who have had known exposure to monkeypox; individuals who have known, or presumed, exposure to monkeypox; and individuals who are in certain occupational risk groups.

Table 1 provides greater detail on the CDC’s three categories of eligibility for the strategic distribution of the JYNNEOS and ACAM2000 vaccine.

Table 1

| CDC Vaccination Strategies Used in the 2022 U.S. Monkeypox Outbreak | | |
|---|---|--|
| Strategy | Definition | Criteria |
| Post-Exposure Prophylaxis (PEP) | Vaccination after known exposure to monkeypox | People who are known contacts to someone with monkeypox who are identified by public health authorities, for example via case investigation, contact tracing, or risk exposure assessment |
| Expanded Post-Exposure Prophylaxis (PEP++) | Vaccination after known or presumed exposure to monkeypox | Any of the following: <ul style="list-style-type: none"> – People who are known contacts to someone with monkeypox – People who are aware that a recent sex partner within the past 14 days was diagnosed with monkeypox – Men who have sex with men, or transgender and gender diverse people who have sex with men, who have had any of the following in the past 14 days: sex with multiple partners (or group sex); sex at a commercial sex venue; or sex in association with a defined geographical area where monkeypox transmission is occurring |
| Pre-Exposure Prophylaxis (PrEP) | Vaccination before exposure to monkeypox | People in certain occupational risk groups, including research laboratory workers performing diagnostic testing for monkeypox virus, and members of health care worker response teams designated by appropriate public health and antiterror authorities. |
| Source: Centers for Disease Control and Prevention (CDC) | | |

Vaccine Distribution in Texas. Currently, the federal government has allocated the JYNNEOS vaccine to the State of Texas for the prevention of monkeypox.²⁶ Jurisdictions may request shipments of the ACAM2000 vaccine directly from the federal government.²⁷ Currently, neither Harris County Public Health nor the Houston Health Department have the ACAM2000 vaccine.

The Texas Department of State Health Services (DSHS) distributes the JYNNEOS vaccine to both local health departments and DSHS public health regions based on the number of individuals currently at the greatest risk of being exposed to the monkeypox virus, following federal guidance.²⁸

On July 10, 2022, the City of Houston Health Department (HHD) received its first shipment of the JYNNEOS vaccine from DSHS. Houston Health Department was the only local health department in the region receiving shipments of the JYNNEOS vaccine from DSHS in adherence with federal guidance. Since July 2022, HHD has received an additional three shipments for a total of 14,084 vials. HHD provided Harris County Public Health (HCPH) with 30% of each shipment of the JYNNEOS vaccine received from DSHS.²⁹ On August 22, 2022, federal guidance expanded the eligibility for ordering additional doses of the JYNNEOS vaccine to local health departments through DSHS. Local health departments who have utilized 85% of their original allocation, including HCPH, are now eligible to request additional doses of the JYNNEOS vaccine directly from DSHS.

Table 2 provides the dates and number of vials of the JYNNEOS vaccine provided to HHD from DSHS, as well as the number of vials then distributed to HCPH. As of October 11, 2022, HCPH has not received any additional vaccines since the August 17th allocation.³⁰

| Table 2 Distribution of JYNNEOS Vaccine Vials from DSHS to HHD to HCPH | | |
|---|-----------------------|-------------------------|
| Date | Vials Received by HHD | Vials Delivered to HCPH |
| 7/10/2022 | 300 | 0 |
| 7/22/2022 | 5,024 | 1,598 |
| 8/2/2022 | 6,740 | 2,022 |
| 8/17/2022 | 2,020 | 606 |
| Total: | 14,084 | 4,226 |

Source: Houston Health Department

Harris County Public Health (HCPH) is currently offering the JYNNEOS vaccine to certain eligible populations in alignment with the CDC's monkeypox vaccination strategy. Individuals with known or possible exposure to monkeypox are the highest priority eligible population, referred to as Group A. Individuals who are at an increased risk of exposure to monkeypox, regardless of their gender identity or sexual

orientation, referred to as Group B, are prioritized after Group A. Currently, HCPH is only offering vaccines to individuals who meet the eligibility criteria listed for Groups A and B.

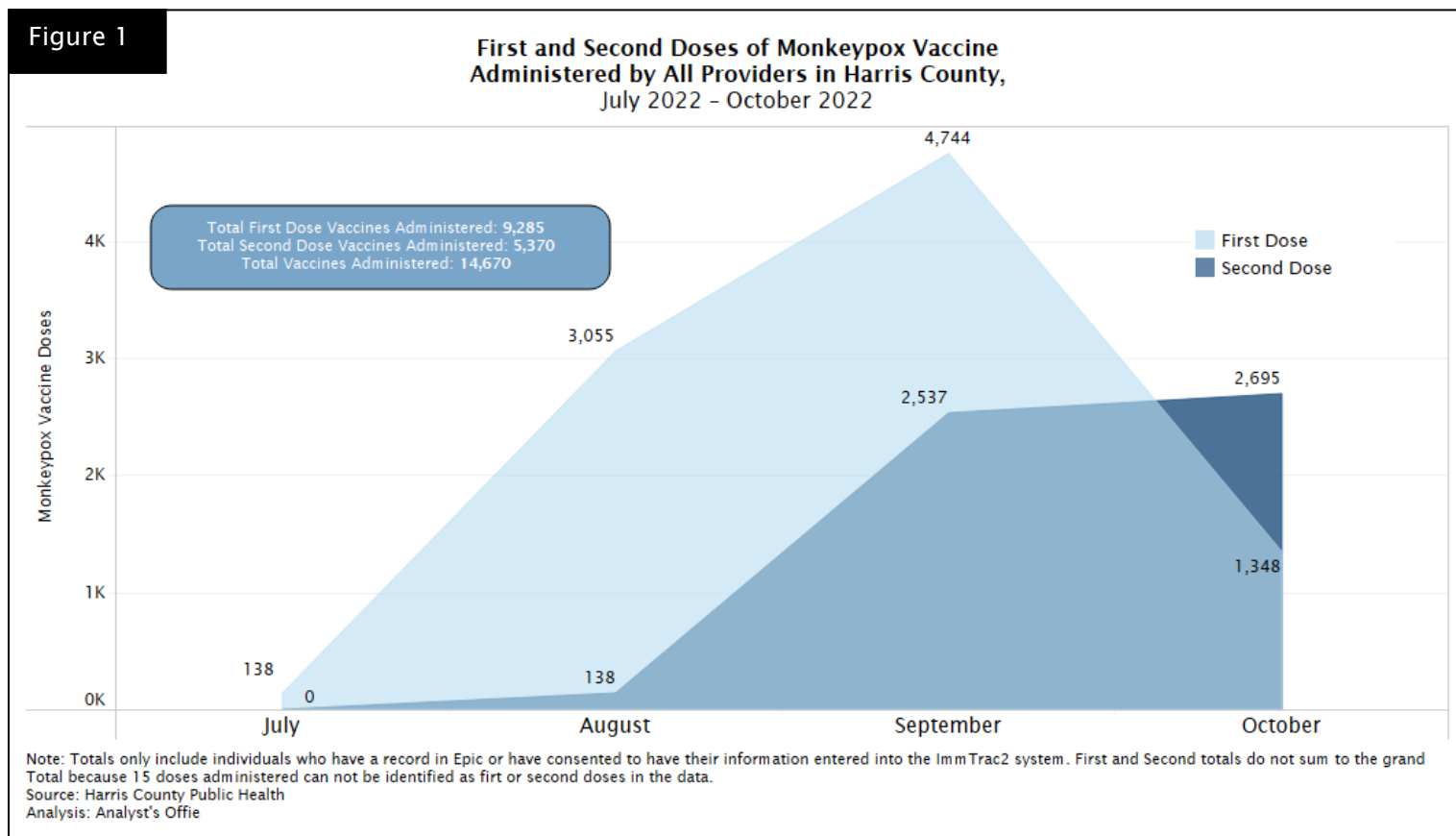
Table 3 provides greater detail on HCPH's eligibility criteria for Groups A and B.

| Table 3 | HCPH Monkeypox Vaccine Eligibility Groups ^{*31} |
|--|--|
| HCPH Eligibility Groups | Populations |
| Group A | <ul style="list-style-type: none"> – People confirmed to have had high- or intermediate-risk contact with someone with monkeypox, as defined by CDC. – People who attended an event or venue where there was a high risk of exposure to someone with confirmed monkeypox virus through skin-to-skin or sexual contact. – Children 6 months to 17 years old, as needed depending on risk. |
| Group B | <p>HCPH has expanded vaccination eligibility to include individuals (regardless of gender identity or sexual orientation) who are at an increased risk of monkeypox, such as anyone who:</p> <ul style="list-style-type: none"> – Has had multiple or anonymous sex partners; – Is a sex worker or staff at a venue where sexual activity occurs (e.g., bathhouses, saunas, sex clubs); – Has a diagnosis of chlamydia, gonorrhea, or early syphilis within the previous 12 months; – Is HIV+ or on HIV pre-exposure prophylaxis (PrEP); – Has an immunocompromising condition that may increase their risk for severe disease if infected with the monkeypox virus, such as atopic dermatitis or eczema. |
| <p>Source: Harris County Public Health (HCPH)³² [*]Eligibility criteria are as of September 13, 2022.</p> | |

Harris County Public Health (HCPH) and the Houston Health Department (HHD) have established call centers for individuals to call and schedule vaccination appointments. Individuals who call will receive an eligibility screening over the phone. If eligible, the individual is scheduled for a vaccination appointment at an HCPH or HHD location. Individuals referred by an epidemiologist or physician will not have to go through an eligibility screening. Appointments to receive the second dose of the JYNNEOS vaccine will be scheduled during the first dose appointment. If individuals are past due for their second dose appointment, HCPH will send a text message reminder. HCPH is currently taking walk-ins at their vaccination locations with no waiting periods.

ADMINISTRATION OF THE MONKEYPOX VACCINE

Figure 1 provides the total number of vaccines administered in each month by all providers in Harris County.



Between June 27, 2022, and October 9, 2022, HCPH and HHD administered at least one dose of the JYNNEOS vaccine to 14,670 individuals. Of that total, 9,285 individuals (63.3%) received their first dose, and 5,370 (36.6%) individuals received their second dose.^{vii} ^{viii} The number of individuals fully vaccinated in Harris County increased 101% from September to October, from 2,675 fully vaccinated individuals in September to 5,370 fully vaccinated individuals in October.

^{vii} According to the CDC, an individual being considered fully vaccinated 14 days after receiving the second dose of the monkeypox vaccine.

^{viii} In addition to the 9,285 individuals who received their first dose and 5,370 who received their second dose vaccines, 15 additional individuals received their monkeypox vaccine (for a total of 14,670), but whether they received their first or second dose is not specified in the data.

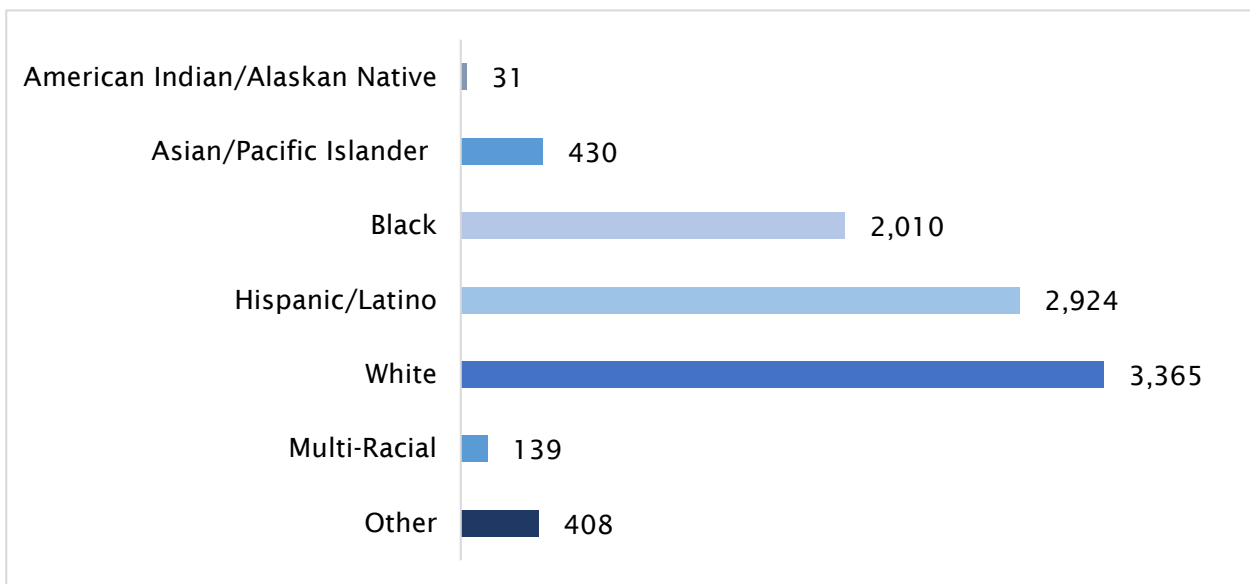
TOTAL NUMBER OF INDIVIDUALS WHO RECEIVED AT LEAST ONE DOSE BY RACE AND ETHNICITY

Figure 2 presents the number of individuals in Harris County who have received at least one dose of the JYNNEOS vaccine by race and ethnicity.

Figure 2

Individuals in Harris County Who Received Least One Dose by Race and Ethnicity*

June 27, 2022 – October 9, 2022



*Note: Data only includes individuals who have a record in Epic or have consented to have their data entered into the ImmTrac2 system.
Source: Harris County Public Health
Analysis: Analyst's Office

As shown in **Figure 2**, of the individuals in Harris County who have received at least one dose of the monkeypox vaccine:

- 0.3% (31) identify as American Indian/Alaskan Native;
- 4.6% (430) identify as Asian American/Pacific Islander;
- 21.6% (2,010) identify as Black;
- 31.4% (2,924) identify as Hispanic/Latino;
- 36.2% (3,365) identify as White;
- 1.5% (139) identify as Multi-Racial; and
- 4.4% (408) identify as Other.

TOTAL NUMBER OF INDIVIDUALS WHO RECEIVED AT LEAST ONE DOSE BY COMMISSIONER PRECINCT

Table 4 presents the total number of individuals in Harris County who have received at least one dose of the JYNNEOS vaccine by commissioner precinct.

Table 4

| Number of Individuals With At Least One Dose by Commissioner Precinct* ix June 27, 2022 – October 12, 2022 | | | | |
|---|------------|------------|------------|--------------------|
| Precinct 1 | Precinct 2 | Precinct 3 | Precinct 4 | Total |
| 3,086 | 885 | 1,325 | 1,514 | 9,307 ^x |

*Note: Data only includes individuals who have a record in Epic or have consented to have their data entered into the ImmTrac2 system.
Source: Harris County Public Health
Analysis: Analyst's Office

Between June 27, 2022, and October 9, 2022, 9,307 individuals in Harris County received at least one dose of the JYNNEOS vaccine.

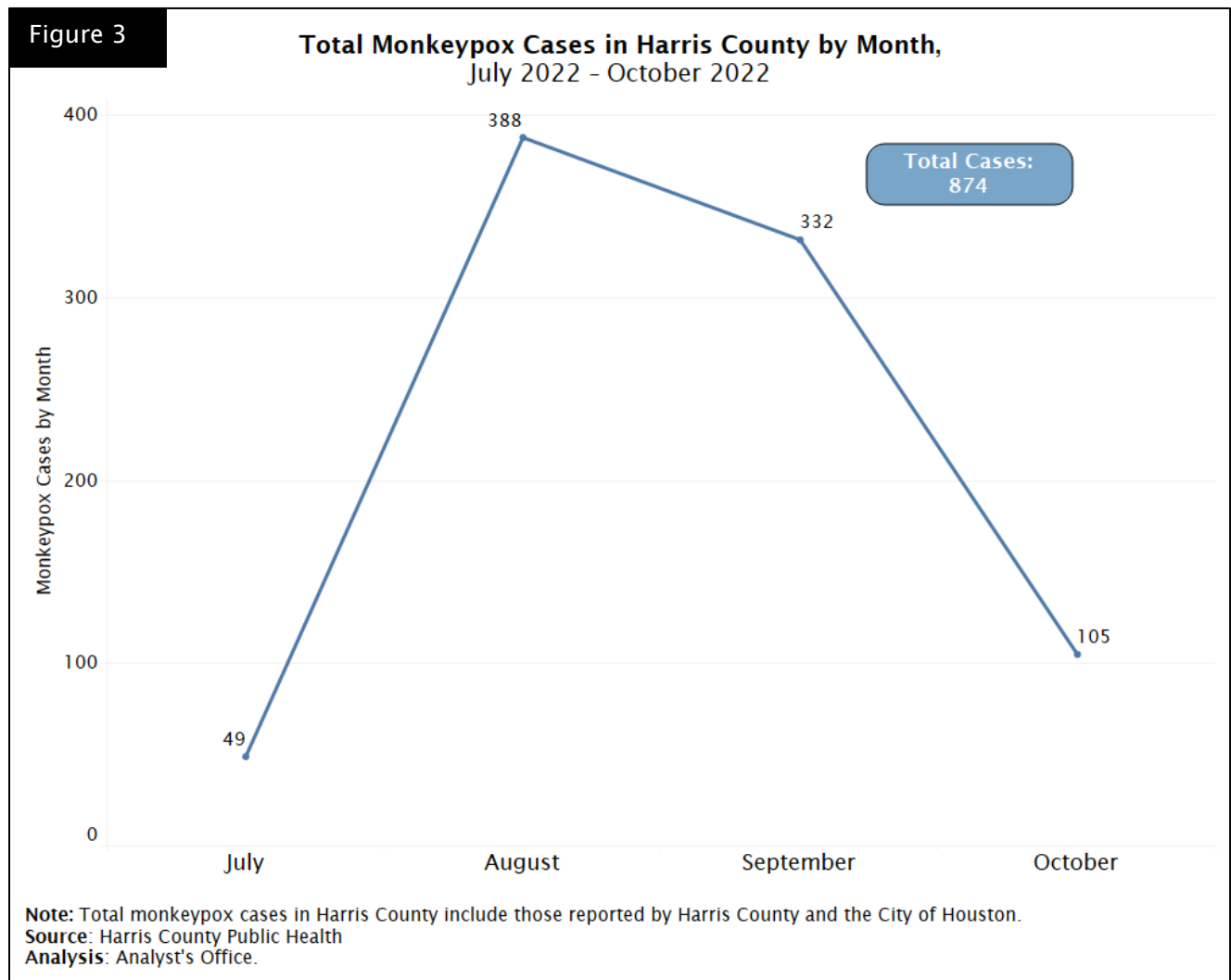
^{ix} Commissioner precinct boundaries do not align with zip code boundaries; some zip codes are in multiple precincts. Zip codes that include multiple precincts are assigned to the precinct where the majority of the landmass of a zip code is located. Zip codes are assigned to commissioner precincts in accordance with the precinct boundaries that went into effect November 3, 2021.

^x Precinct totals do not sum to Total because 2,497 individuals who received at least one dose have addresses that cannot be geo-coded into a Precinct.

CONFIRMED MONKEYPOX CASES IN HARRIS COUNTY

Between June 18, 2022, and October 9, 2022, there were 874 confirmed cases of monkeypox in Harris County.

Figure 3 presents the total number of confirmed monkeypox cases in Harris County by month as of October 9, 2022.



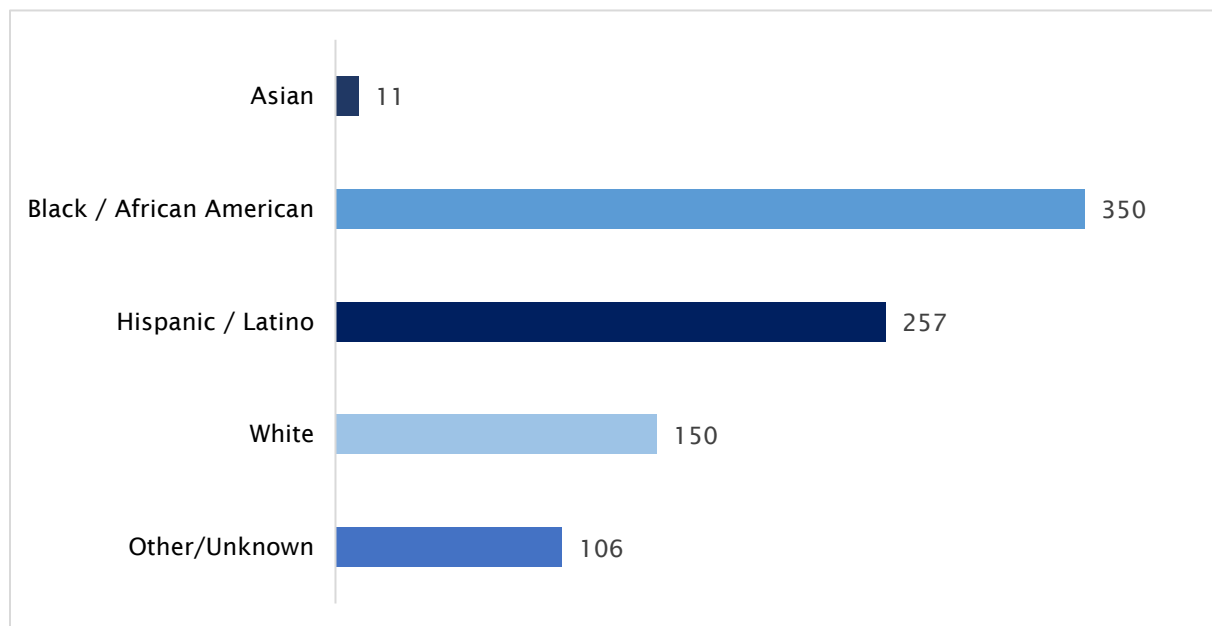
Monkeypox cases in Harris County have decreased in the last two months. In September, there were 332 new monkeypox cases in Harris County, and in October, there were 105. This reflects a 68% decrease in cases (from 332 to 105) from September (the prior memo).

CONFIRMED MONKEYPOX CASES IN HARRIS COUNTY BY RACE AND ETHNICITY

Figure 4 presents the total number of confirmed monkeypox cases in Harris County by race and ethnicity as of October 9, 2022.

Figure 4

Total Number of Confirmed Monkeypox Cases by Race and Ethnicity June 18, 2022 – October 9, 2022



*Note: Data only includes individuals who have a record in Epic or have consented to have their data entered into the ImmTrac2 system.
Source: Harris County Public Health
Analysis: Analyst's Office

As shown in **Figure 4**, of the total number of confirmed monkeypox cases in Harris County:

- 1.3% (11) identify as Asian American/Pacific Islander;
- 40.0% (350) identify as Black;
- 29.4% (257) identify as Hispanic/Latino;
- 17.2% (150) identify as White; and
- 12.1% (106) identify as Other/Unknown.

CONFIRMED MONKEYPOX CASES BY COMMISSIONER PRECINCT

Table 5 presents the total number of confirmed monkeypox cases in Harris County by commissioner precinct.

Table 5

| Total Number of Confirmed Monkeypox Cases by Commissioner Precinct ^{xi} June 18, 2022 – October 12, 2022 | | | | |
|--|------------|------------|------------|--------------------|
| Precinct 1 | Precinct 2 | Precinct 3 | Precinct 4 | Total |
| 304 | 148 | 98 | 317 | 874 ^{xii} |

Source: Harris County Public Health

Between June 18, 2022, and October 9, 2022, there were 874 confirmed cases of monkeypox in Harris County.

^{xi} Commissioner precinct boundaries do not align with zip code boundaries; some zip codes are in multiple precincts. Zip codes that include multiple precincts are assigned to the precinct where the majority of the landmass of a zip code is located. Zip codes are assigned to commissioner precincts in accordance with the precinct boundaries that went into effect November 3, 2021.

^{xii} Precinct totals do not sum to total because 7 cases cannot be geo-coded into a precinct.

ENDNOTES

- ¹ *Houston Health Receives Monkeypox Vaccine Shipment*. (n.d.). Retrieved September 7, 2022, from <http://houstontx.gov/mayor/press/2022/health-dept-receives-monkeypox-vaccine.html>
- ² CDC. (2022, July 28). *Monkeypox Technical Reports*. Centers for Disease Control and Prevention. <https://www.cdc.gov/poxvirus/monkeypox/cases-data/technical-report/report-1.html>
- ³ *Lab Advisory: HHS Declares Monkeypox a Public Health Emergency*. (2022, August 31). https://www.cdc.gov/locs/2022/08-05-2022-Lab-Advisory-HHS_Declares_Monkeypox_Public_Health_Emergency.html
- ⁴ *Monkeypox | Disease Directory | Travelers' Health | CDC*. (n.d.). Retrieved September 7, 2022, from <https://wwwnc.cdc.gov/travel/diseases/monkeypox>
- ⁵ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ⁶ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ⁷ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ⁸ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ⁹ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ¹⁰ *Monkeypox Info | Home page*. (n.d.). Retrieved September 8, 2022, from <https://dshs.texas.gov/IDCU/disease/monkeypox/Monkeypox/>
- ¹¹ *Monkeypox | Disease Directory | Travelers' Health | CDC*. (n.d.). Retrieved September 7, 2022, from <https://wwwnc.cdc.gov/travel/diseases/monkeypox>
- ¹² *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ¹³ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ¹⁴ *Monkeypox*. (n.d.). Retrieved September 7, 2022, from <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
- ¹⁵ Commissioner, O. of the. (2022, August 11). *Monkeypox Update: FDA Authorizes Emergency Use of JYNNEOS Vaccine to Increase Vaccine Supply*. FDA; FDA. <https://www.fda.gov/news-events/press-announcements/monkeypox-update-fda-authorizes-emergency-use-jynneos-vaccine-increase-vaccine-supply>
- ¹⁶ Commissioner, O. of the. (2022, August 11). *Monkeypox Update: FDA Authorizes Emergency Use of JYNNEOS Vaccine to Increase Vaccine Supply*. FDA; FDA. <https://www.fda.gov/news-events/press-announcements/monkeypox-update-fda-authorizes-emergency-use-jynneos-vaccine-increase-vaccine-supply>
- ¹⁷ CDC. (2022, August 30). *Jynneos Vaccine*. Centers for Disease Control and Prevention. <https://www.cdc.gov/poxvirus/monkeypox/vaccines/jynneos.html>
- ¹⁸ Commissioner, O. of the. (2022, August 11). *Monkeypox Update: FDA Authorizes Emergency Use of JYNNEOS Vaccine to Increase Vaccine Supply*. FDA; FDA. <https://www.fda.gov/news-events/press-announcements/monkeypox-update-fda-authorizes-emergency-use-jynneos-vaccine-increase-vaccine-supply>
- ¹⁹ Sep 04 & 2007. (n.d.). *FDA approves Acambis smallpox vaccine*. CIDRAP. Retrieved September 8, 2022, from <https://www.cidrap.umn.edu/news-perspective/2007/09/fda-approves-acambis-smallpox-vaccine>
- ²⁰ CDC. (2022, August 30). *ACAM2000 Vaccine*. Centers for Disease Control and Prevention. <https://www.cdc.gov/poxvirus/monkeypox/vaccines/acam2000.html>
- ²¹ Research, C. for B. E. and. (2022). *ACAM2000 (Smallpox Vaccine) Questions and Answers*. FDA. <https://www.fda.gov/vaccines-blood-biologics/vaccines/acam2000-smallpox-vaccine-questions-and-answers>
- ²² U.S. Food & Drug Administration. (2022). *ACAM2000 (Smallpox Vaccine) Questions and Answers*. FDA. <https://www.fda.gov/vaccines-blood-biologics/vaccines/acam2000-smallpox-vaccine-questions-and-answers>
- ²³ CDC. (2022, August 30). *ACAM2000 Vaccine*. Centers for Disease Control and Prevention. <https://www.cdc.gov/poxvirus/monkeypox/vaccines/acam2000.html>
- ²⁴ CDC. (2022, August 30). *ACAM2000 Vaccine*. Centers for Disease Control and Prevention. <https://www.cdc.gov/poxvirus/monkeypox/vaccines/acam2000.html>
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- ²⁶ (N.d.). Retrieved September 7, 2022, from <https://www.dshs.state.tx.us/news/updates.shtm#monkeypox>
- ²⁷ Affairs (ASPA), A. S. for P. (2022, July 1). *Biden-Harris Administration Announces Additional Deliveries of Vaccine as Part of Nationwide Vaccine Strategy for Preventing Monkeypox* [Text]. HHS.Gov. <https://www.hhs.gov/about/news/2022/07/01/biden-harris-administration-announces-additional-deliveries-vaccine-as-part-of-nationwide-vaccine-strategy-for-preventing-monkeypox.html>
- ²⁸ (N.d.). Retrieved September 7, 2022, from <https://www.dshs.state.tx.us/news/updates.shtm#monkeypox>
- ²⁹ *Houston Health Department to begin intradermal monkeypox vaccination Tuesday | Houston Health Department*. (n.d.). Retrieved September 8, 2022, from <https://www.houstonhealth.org/news/news-releases/houston-health-department-begin-intradermal-monkeypox-vaccination-tuesday>
- ³⁰ Analyst's Office email correspondence with Rachel Roy, Ph.D.(c), MPH, Disaster Epidemiologist, Office of Public Health Preparedness and Response, Harris County Public Health. October 12, 2022
- ³¹ Analyst's Office email correspondence with Rachel Roy, Ph.D.(c), MPH, Disaster Epidemiologist, Office of Public Health Preparedness and Response, Harris County Public Health. October 12, 2022.



The Harris County Commissioners Court's Analyst's Office provides the Harris County Commissioners Court members with objective, nonpartisan, and timely fiscal and policy analysis related to the efficiency and effectiveness of various County operations.

This memo was prepared by Ramin Naderi, Analyst and Aresha Davwa, Analyst.

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